Version date: may 2022

Poliuretan® Spray S-303 HFO

Isocianato H

DESCRIPTION

A polyurethane system made up of two components – a polyol mixture and an isocyanate – that is sprayed in-situ to form rigid closed-cell foams for thermal insulation purposes.

Poliuretan Spray S-303 HFO has been formulated using hydrofluoroolefins (HFOs) – fourth-generation foaming agents, which means its contribution to global warming is very low.

Green Products

At Synthesia Technology we use PET recycled from plastic bottles to produce polyols, a key raw material used in the manufacture of high-performance insulating materials. We are showing that it is possible to use plastic responsibly – by recycling it into a new product that helps to reduce energy consumption and CO_2 emissions for the sake of all. Thus, we are promoting the development of a circular, suitable economy.

We manufacture the **Poliuretan Spray S-303 HFO** system with:

23% of *recycled PET*

17% of *renewably sourced products*

*Equivalent to 54 PET bottles** per m^2 of sprayed-on foam**

** Based on a weight of 8,6 g per PET bottle*
*** Based on a thickness of 10cm and an applied density of 40 kg/m³*

AENOR N MARK

AENOR has certified our **Poliuretan Spray S-303 HFO** spray system with its product-quality N Mark under standard EN 14315-1 as a thermal insulation material for buildings. Contract No 020/000186.

AENOR
AISLANTE TÉRMICO
Contract Nber: 020/000186
This component (A) is certified as a complete system with the component B ISOCIANATO H

KEYMARK

The **Poliuretan Spray S-303 HFO** spray system is CEN KEYMARK SCHEME-certified as a thermal insulation product that is compliant with standard EN 14315-1.

0099

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NSAI Agrément

NSAI Agrément certifies that the **Poliuretan Spray S-303 HFO** spray system meets the requirements of the **"Building Regulations 1997 to 2019"** if applied as per the instructions set forth in Certificate 19/0414.

COMPONENTS

COMPONENT A: **Poliuretan Spray S-303 HFO**
A mixture of polyols containing catalysts, flame-retardants and foaming agents (it contains HFOs).

COMPONENT B: **ISOCIANATO H**
Polymeric methylene diphenyl diisocyanate (MDI).

APPLICATIONS

The **Poliuretan Spray** system is sprayed according to a mixing ratio of 1:1 by volume using heated, high-pressure equipment. Its main applications are the external thermal insulation of façades and the internal thermal insulation of ceilings. Once it has been sprayed on, its density ranges from 35 to 45 g/L.

Application advantages:

- Complete suppression of thermal bridges. Since it is continuous, the insulation does not have any joints or cracks.
- Good adhesion to the substrate. No glues or adhesives need to be used for installation.
- Possibility of insulating and waterproofing in the same process. This is due, on the one hand, to its watertight-, closed-cell structure and, on the other, to the continuous manner in which it is applied, which allows doing away with joints.
- Mobility. It can be taken to construction sites in no time, there being no need to haul to or store on the site bulky products as in the case of other insulating materials.
- Sealing of gaps, thus muffling the passage of sound.
- Increase in the floor space compared to other insulating materials.

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CHARACTERISTICS OF THE COMPONENTS

Characteristics	Units	H	S-303 HFO
Specific weight 20°C	g/cm^3	1.23	1.14
Viscosity	cPS	150-250 (25°C)	200-500 (22°C)
Free NCO content	%	30-32	-

SYSTEM SPECIFICATIONS

The specifications of the system were measured in a test vessel at 22°C with the mixing ratio specified in Synthesia Technology's standard (MANS -01) and as per Annex E of product standard EN 14315-1.

A/B mixing ratio: 1:1 by volume
1:1 ± 4 by weight

Specifications	Units	S-303 HFO-W	S-303 HFO-S
Cream time	s	3 ± 1	3 ± 1
Gel time	s	6 ± 2	7 ± 2
Set-to-touch time	s	8 ± 3	8 ± 3
Free density	g/L	33 ± 3	33 ± 3

PREPARATION OF THE SUBSTRATE

Surfaces should be clean, dry, and free of dust and grease so that the foam can properly adhere to the substrate; if the substrate is a metal, it should also be free of rusting. In favourable conditions, the **Poliuretan Spray** foam adheres well to most building materials. Even so, should its adhesion prove to be not strong enough, a suitable primer should be used, and a minimum spray density of 38 kg/m^3 attained.

Nevertheless, we cannot guarantee that this system will adhere to all types of substrates and primers. Consequently, the user should carefully study each specific case.

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SPRAYING PROCESS

The foam's performance is affected by quite a few factors, which are listed below:

- The atmospheric conditions: ambient/room and substrate-surface temperature and humidity and other environmental factors (wind...).
- The settings of the equipment. The correct mixing ratio.
- The type of application: vertical, horizontal, or upside down.
- The application method: coat thickness, use of varnish.

In order for the foam to have an optimal performance and properties, the application conditions listed in the following table should be taken into account:

		S-303 HFO-W	S-303 HFO-S
SETTINGS OF THE EQUIPMENT			
Component mixing ratio		1:1 by volume	
Temperature of the components		15 - 30°C	
Temperature of the hoses and pre-heaters		25 - 50°C	
Static pressure		1200 - 1800 psi / 80 - 120 bar	
Maximum difference in dynamic pressure between components		290 psi / 20 bar	
ENVIRONMENTAL CONDITIONS			
Ambient/room temperature		+5 to +30°C	+10 to +40°C
Wind speed		≤ 30 km/h	
SUBSTRATE CONDITIONS			
Temperature		+5 to +30 °C	+10 to +40 °C
Moisture	Porous substrates	≤ 20 %	
	Non-porous substrates	No surface condensation	

The coat thickness can be controlled without any problems and modified by varying the spray rate and/or the mixing chamber of the gun, and it should range from 10 to 20 mm.

Please note that the smaller the number of coats for the same thickness, the higher the foam's performance. However, it is not advisable to spray on coats having thicknesses exceeding 20 mm in order to prevent pockets and having issues owing to the strong exothermic characteristics of the reaction and thus for the foam to maintain its properties.

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CHARACTERISTICS OF THE FOAM

Characteristics		Units	S-303 HFO
Closed cells	ISO 4590	%	≥ 90
Thermal resistance & thermal conductivity	EN 12667 EN 12939	-	See the table of characteristics below
Compressive strength [2]	EN 826	kPa	≥ 150
Reaction to fire (exposed foam)	EN 13501-1	Euroclass	E [1]
Water absorption (W_p)	EN 1609	kg/m^2	≤ 0.2
Water vapour resistance factor (μ)	EN 12086	-	≥ 70
Dimensional stability [2]	EN 1604	%	DS(TH)2
Side-perpendicular tensile strength	EN 1607	kPa	≥ 100 (A3)

[1] Test result valid for any spray thickness (test conducted with a thickness of 60 mm).
[2] Level not declared in DoP of the CE mark

Table of characteristics

Sprayed-on CCC4 insulation foam (uncoated or open to diffusion).

e_p	25	30	35	40	45	50	55	60	65
λ_D	0,028	0,028	0,028	0,028	0,028	0,028	0,028	0,028	0,028
R_D	0,90	1,10	1,25	1,45	1,65	1,85	2,00	2,20	2,40
e_p	70	75	80	85	90	95	100	105	110
λ_D	0,028	0,028	0,026	0,026	0,026	0,026	0,026	0,026	0,026
R_D	2,55	2,75	3,10	3,25	3,45	3,65	3,85	4,05	4,25
e_p	115	120	125	130	135	140	145	150	155
λ_D	0,026	0,025	0,025	0,025	0,025	0,025	0,025	0,025	0,025
R_D	4,45	4,80	5,00	5,20	5,40	5,60	5,80	6,00	6,20
e_p	160	165	170	175	180	185	190	195	200
λ_D	0,025	0,025	0,025	0,025	0,025	0,025	0,025	0,025	0,025
R_D	6,45	6,65	6,85	7,05	7,25	7,45	7,65	7,85	8,05

e_p Thickness of the foam (mm)
λ_D Declared aged thermal conductivity (W/mK)
R_D Thermal resistance level ($m^2 \cdot K/W$)

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INDOOR AIR EMISSIONS (VOCs)

Regulación	Poliuretan Spray S-303 HFO
French VOC Regulation	Class A+
French CMR components	Compliant
Italian CAM Edilizia	Compliant
Belgian Regulation	Compliant
Indoor Air Comfort GOLD®	Compliant
Blue Angel (DE-UZ 132)	Compliant
BREEAM International	Exemplary level
LEED v4.1 BETA (outside U.S.)	Compliant

Report nº 392-2021-00618901_A issued by Eurofins.

SAFETY RECOMMENDATIONS

Poliuretan Spray S-303 HFO (Component A) causes skin irritation and severe ocular lesions. In addition, it can cause irreparable damage to health and to the aquatic environment.

Isocyanate H (Component B) causes skin, eye and airway irritation. It can also cause irreversible damage to human health by inhalation or through contact with the skin.

When working with the product, the workers should wear complete personal protective gear, including a full face-mask breathing apparatus (which should supply fresh air if working inside confined, unventilated spaces), protective workwear, and safety gloves. Any other workers who are not going to take part in the application of the product should stay clear from the area. In addition, additional ventilation might be required in the form of natural or forced draught ventilation to prevent gases from building up and moving into other occupied areas of the building during the spraying process.

In the case of already occupied buildings, a 24h waiting period before reoccupation is recommended.

When handling the system and/or the products, it is advisable to take all safety and precautionary measures described in each product's MSDS.

SUPPLY FORM

Check with the Sales Department the different supply formats.

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STORAGE RECOMMENDATIONS

VERY IMPORTANT: The components of the **Poliuretan Spray S-303 HFO** system are sensitive to moisture, so they should be stored in airtight drums or tanks. **The storage temperature should fall within the following temperature range: +5 +35°C.** At lower temperatures, the viscosity of the polyols will increase considerably, thereby hindering application; in addition, the isocyanate might crystallise. Higher temperatures can cause changes in the polyols, a loss of the expanding agent, a greater consumption of product, the swelling of the drums, and uncontrolled foaming on insertion of the pump's suction tube in the drums. To prevent the latter, it is advisable to leave the drums sit for a while after having been carried by road in a well-ventilated, as-cool-as-possible area before starting to work with them.

If the drums are fitted with white plastic caps, special care should be taken when handling the latter as they are more fragile than metal caps and can become distorted.

In order for the system to maintain the aforementioned characteristics, the drums should be kept tightly closed when not in use.

Under proper storage conditions, the shelf lives are 4 months for S-303 HFO and 9 months for Component B (isocyanate).

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APPENDIX: APPLICATION ISSUES

Our Sales and Technical Support Service is available to answer any questions you might have during the preparation of the product. Nevertheless, below we have listed some of the most common issues that can occur during the spraying process:

Issue	Possible cause	Solution
Irregularly shaped span	Improperly adjusted gun pin or dirt in the mixing chamber	Adjust the position of the pin. Clean the chamber
Span with colour veining	Poor mixture owing to components clogging the gun or having differences in viscosity	Check the pressures and unclog the gun where appropriate. Adjust and increase the temperature.
Poor, closed span	High component viscosity. Cold weather	Increase the spray temperature and pressure
Very open span and misting	Too much air in the gun's nozzle Mixing pressure too high	Reduce the airflow Reduce the pressure somewhat
The material takes a while to react; it sags	Cold surface	Turn up the heating of the hoses
Material sprayed too fast; irregular finish; misting	The pressure is too high	Lower the gun's air pressure and mixing pressure
The material arrives at the surface looking granulated and clogs the gun	The temperature is too high	Turn down the heating of the hoses
Air pockets form	The coats are more than 20mm thick	Apply thinner coats

This is the best information available, although not guaranteed, due to the complexity of the use of raw materials and equipment, which may alter the results.

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